Unpacking quality in Head Start classrooms: Relationships among dimensions of quality at different levels of analysis

Gary Resnick, Ph.D. and Nicholas Zill, Ph.D.

Westat

Classroom Quality Variables

Structure

→ Adult-Child Ratio

Teacher Background and Experience

→ Years of teaching Head Start

→ Highest education level achieved

→ Membership in an Early Education association

→ Teacher Demographics (age, ethnicity)

Classroom Processes

→ Overall Quality Factor: ECERS Language Scale plus Assessment Profile Scheduling and Learning Environment

→ ECERS Language Scale

→ Caregiver Interaction Scale (Arnett)

Fall 1997 - Spring 1998 Classroom Data

- Fall 1997: 530 classrooms observed
- Spring 1998: 560 classrooms observed
- Reliabilities (Alpha coefficients):
  - Total ECERS Score = .90
  - Assessment Profile Learning Environment = .62
  - Assessment Profile Scheduling = .84
  - Caregiver Interaction Scale (Arnett) = .98
- Inter-Rater Agreement
  - ECERS = 86% (Agreement or off by one)
  - Assessment Profile Learning Environment and Scheduling = 91%

Head Start Teachers Are Well-Qualified

	Fall 1997 (N=437)	Spring 1998 (N=517)
HIGHEST LEVEL OF EDUCATION ACHIEVED		
HIGH SCHOOL/GED	10.8%	4.3%
ATTENDED COLLEGE	31.4%	41.2%
ASSOCIATES	29.7%	23.9%
BA/UNDERGRADUATE DEGREE	24.9%	26.6%
GRADUATE DEGREE	3.2%	4.0%
Total	100.0%	100.0%
YEARS TEACHING HEAD START		
1-2 YRS	14.2%	14.1%
3-4 YRS	22.7%	19.8%
5-9 YRS	34.1%	39.1%
10+ YRS	29.0%	26.9%
Total	100.0%	100.0%
CDA CERTIFICATE/CREDENTIAL?		
NO	23.9%	20.8%
YES	76.1%	79.2%
Total	100.0%	100.0%

Classroom Quality: Change Over Time

- *Classroom Quality is Consistent Over Two Years:* Classroom quality scores were consistent over the two years, within the same programs, with an average ECERS score of 4.9 (range 0-7), at both time time periods.

  - At both time periods, there were a similar number of classrooms rated "good" quality or higher (78.5 percent in Spring 1997 and 72.4 percent in Fall 1997)

- *Classroom Quality Improves Over the Same Year*: Classroom quality in two measurement periods during the same Head Start year, among the same classrooms, was good and slightly increased from the Fall to the Spring of the same year.
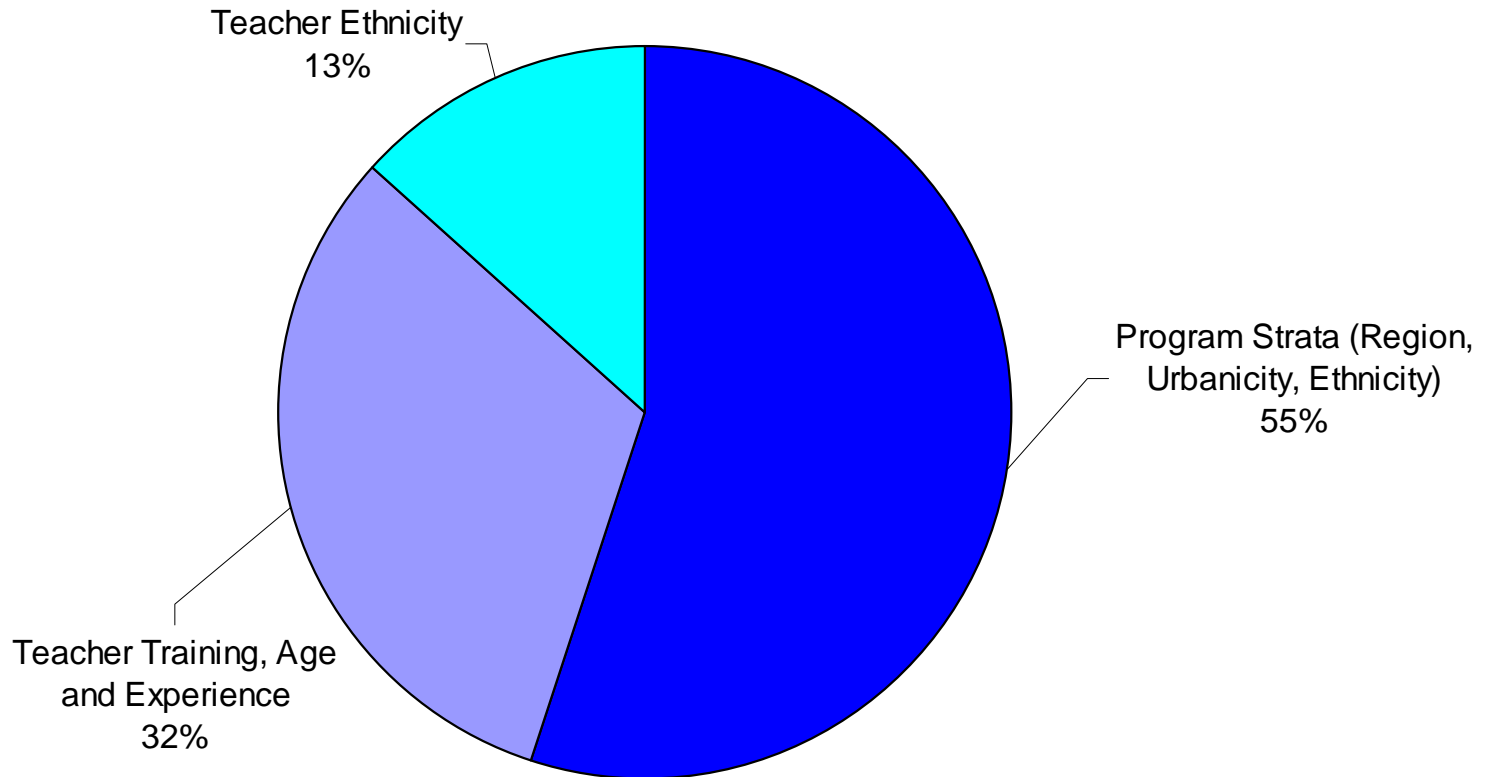
Teacher Backgrounds Are Correlated With Classroom Quality Measures

- *Bivariate Correlations:* classrooms with higher process quality ratings and more sensitive teachers were also those with significantly higher teacher education levels. Additionally, classrooms with lower child:adult ratios and fewer children had more qualified teachers

- *Regression Analyses:* regardless of ethnicity or years teaching Head Start, teachers with higher levels of education were in classrooms with significantly higher quality language activities (as measured by the ECERS Language Subscale), and were significantly more sensitive and responsive

Classroom Quality Varies According to the Socioeconomic Characteristics of the Participating Families in Head Start Centers

- Characteristics of participating families will be used as proxy indicators of socioeconomic characteristics of the Head Start center (the "Head Start community")

- Center-level characteristics were related to classroom quality, as follows:
  - Classrooms with higher quality scores were in centers in which the average family income was significantly higher
  - Average family income explained more variation in the ECERS Language Subscale, than in the total ECERS score (23 vs. 16 percent of variance)
  - Classroom quality was higher in centers with higher percentages of non-minority parents (8 percent variance explained)

Program strata accounted for the largest percentage of total explained variance in program quality, Spring 1998

Teacher Ethnicity
13%

Program Strata (Region, Urbanicity, Ethnicity)
55%

Teacher Training, Age and Experience
32%

Results of Hierarchical Regression
Step 1: Program Strata (Total R-square = .11)
Step 2: Teacher Training, Age, Experience (Total R-square = .17)
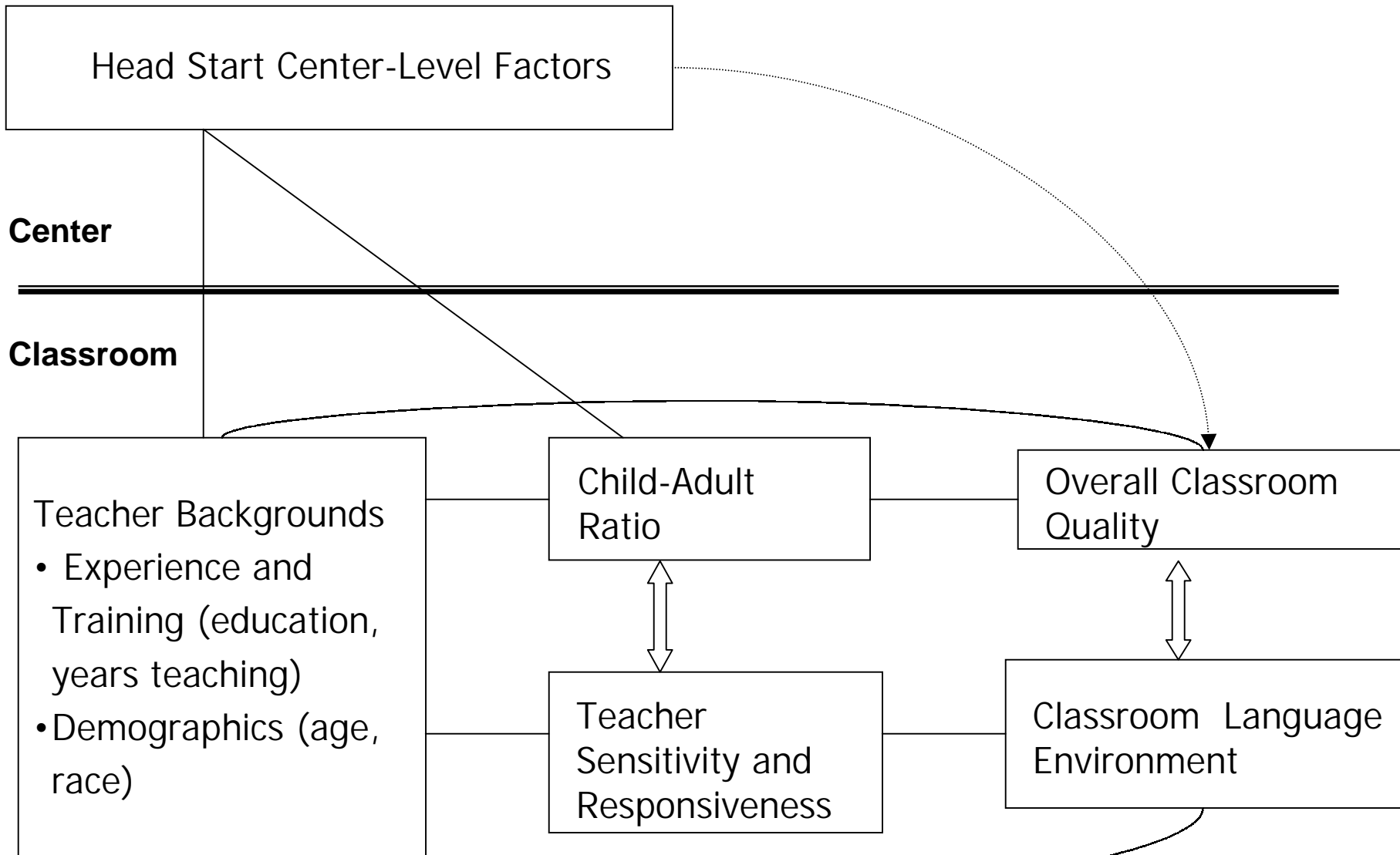Step 3: Teacher Ethnicity (Total R-square = .20)

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Multi-Level Modeling of Classroom and Center Characteristics

Rationale: To assess the influence of center-level socioeconomic characteristics and teacher backgrounds to explain variations in classroom quality. Head Start centers show wide variation in center-level characteristics of participating families.

Method: Two-Level Models using SAS PROC MIXED (Singer, 1998), to predict classroom process quality from classroom-level and center-level factors

- Level-1 (Classroom, N=437) Predictors: Teacher Education, Years Teaching Head Start, Age, Membership in EC associations, and ethnicity

- Level-2 (Center, N=174) Predictors:
  - Center Proportion of Families with Incomes at Higher End of Poverty Range ($1500 or more, Mean=30.9, sd=14.5),
  - Center Proportion Non-Minority Families (Mean=31.5, sd=35.9),
  - Center Proportion of Families with at least some college education (Mean=41.5, sd=15.8),
  - Region (Northeast, Central, South, West),
  - Urban vs. Rural.

"Unpacking" Quality in Head Start: Multi-Level Model

Head Start Center-Level Factors

Center

Classroom

Teacher Backgrounds
• Experience and Training (education, years teaching)
• Demographics (age, race)

Child-Adult Ratio

Overall Classroom Quality

Teacher Sensitivity and Responsiveness

Classroom Language Environment

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Multi-Level Model of Teacher Background and Experience linked to Overall Classroom Quality, Controlling for Center-Level Effects (N=473), Spring 1998

Classroom Quality Factor	Class-Level Effects		Center-Level Effects		Two-Level Effects	
INTERCEPT = 0.016	Estimate	Signif	Estimate	Signif	Estimate	Signif[1]
African-American Teacher	-0.26	**0.02**			-0.14	
Hispanic Teacher	-0.21	0.07			-0.15	
Age Category	0.06				0.06	
Highest Education Level Achieved	-0.05				-0.04	
Yrs Teaching Head Start	0.03				0.02	
Membership in EC Association	0.05				0.07	
Center Prop College Educ Parents			-0.06		-0.04	
Center Proportion Non-Minority			0.79	**0.00**	0.64	**0.01**
Center Proportion Higher Family Income			-0.95	**0.03**	-1.00	**0.03**
Northeast Region			-0.15		-0.15	
South Region			-0.25		-0.23	
West Region			0.37	0.06	0.37	0.06
Rural			-0.20		-0.19	

1. *Significance levels in bold indicate statistically significant effects.*

Multi-Level Model of Teacher Background and Experience linked to Teacher Sensitivity (Arnett) Scores, Controlling for Center-Level Effects (N=473), Spring 1998

Classroom Quality Factor	Class-Level Effects		Center-Level Effects		Two-Level Effects	
INTERCEPT = 73.4	Estimate	Signif	Estimate	Signif	Estimate	Signif[1]
African-American Teacher	-3.12	**0.01**			-1.18	
Hispanic Teacher	-2.07				-0.60	
Age Category	0.16				0.16	
Highest Education Level Achieved	0.65				0.80	
Yrs Teaching Head Start	-0.21				-0.41	
Membership in EC Association	0.13				0.47	
Center Prop College Educ Parents			3.36		3.12	
Center Proportion Non-Minority			5.22	**0.02**	3.94	0.09
Center Proportion Higher Family Income			-4.54		-4.33	
Northeast Region			-0.55		-0.14	
South Region			-2.38		-2.21	
West Region			0.88		0.61	
Rural			-1.23		-0.94	

1. *Significance levels in bold indicate statistically significant effects.*

Multi-Level Model of Teacher Background and Experience Linked to Child-Adult Ratio[1], Controlling for Center-Level Effects (N=473), Spring 1998

Classroom Quality Factor *INTERCEPT = 6.07*	Class-Level Effects		Center-Level Effects		Two-Level Effects	
	Estimate	Signif	Estimate	Signif	Estimate	Signif[2]
African-American Teacher	1.30	**0.00**			0.35	
Hispanic Teacher	0.59	0.07			-0.31	
Age Category	-0.08				-0.08	
Highest Education Level Achieved	0.02				-0.07	
Yrs Teaching Head Start	-0.25				-0.16	
Membership in EC Association	0.27				0.11	
Center Prop College Educ Parents			-0.08		-0.18	
Center Proportion Non-Minority			-2.17	**0.00**	-2.18	**0.00**
Center Proportion Higher Family Income			1.08		1.17	
Northeast Region			-0.98	**0.04**	-0.90	0.07
South Region			1.58	**0.00**	1.64	**0.00**
West Region			-0.10		0.09	
Rural			0.01		-0.02	

1. *Higher child-adult ratio's indicate fewer adults per child, hence lower quality.*

2. *Significance levels in bold indicate statistically significant effects.*

Multi-Level Model of Teacher Background and Experience linked to ECERS Language Scores, Controlling for Center-Level Effects (N=473), Spring 1998

Classroom Quality Factor	Class-Level Effects		Center-Level Effects		Two-Level Effects	
INTERCEPT = 5.04	Estimate	Signif	Estimate	Signif	Estimate	Signif[1]
African-American Teacher	-0.28	**0.02**			-0.14	
Hispanic Teacher	-0.07				0.02	
Age Category	0.07				0.07	
Highest Education Level Achieved	0.03				0.04	
Yrs Teaching Head Start	0.07				0.06	
Membership in EC Association	0.04				0.08	
Center Prop College Educ Parents			0.64	0.06	0.60	0.08
Center Proportion Non-Minority			0.51	**0.02**	0.42	0.07
Center Proportion Higher Family Income			-1.22	**0.00**	-1.21	**0.00**
Northeast Region			-0.07		-0.07	
South Region			-0.38	**0.02**	-0.39	**0.02**
West Region			0.27		0.21	
Rural			-0.11		-0.10	

1. *Significance levels in bold indicate statistically significant effects.*

The Highest Variation Across Centers is in Teacher Sensitivity and Child-Adult Ratio's, Spring 1998
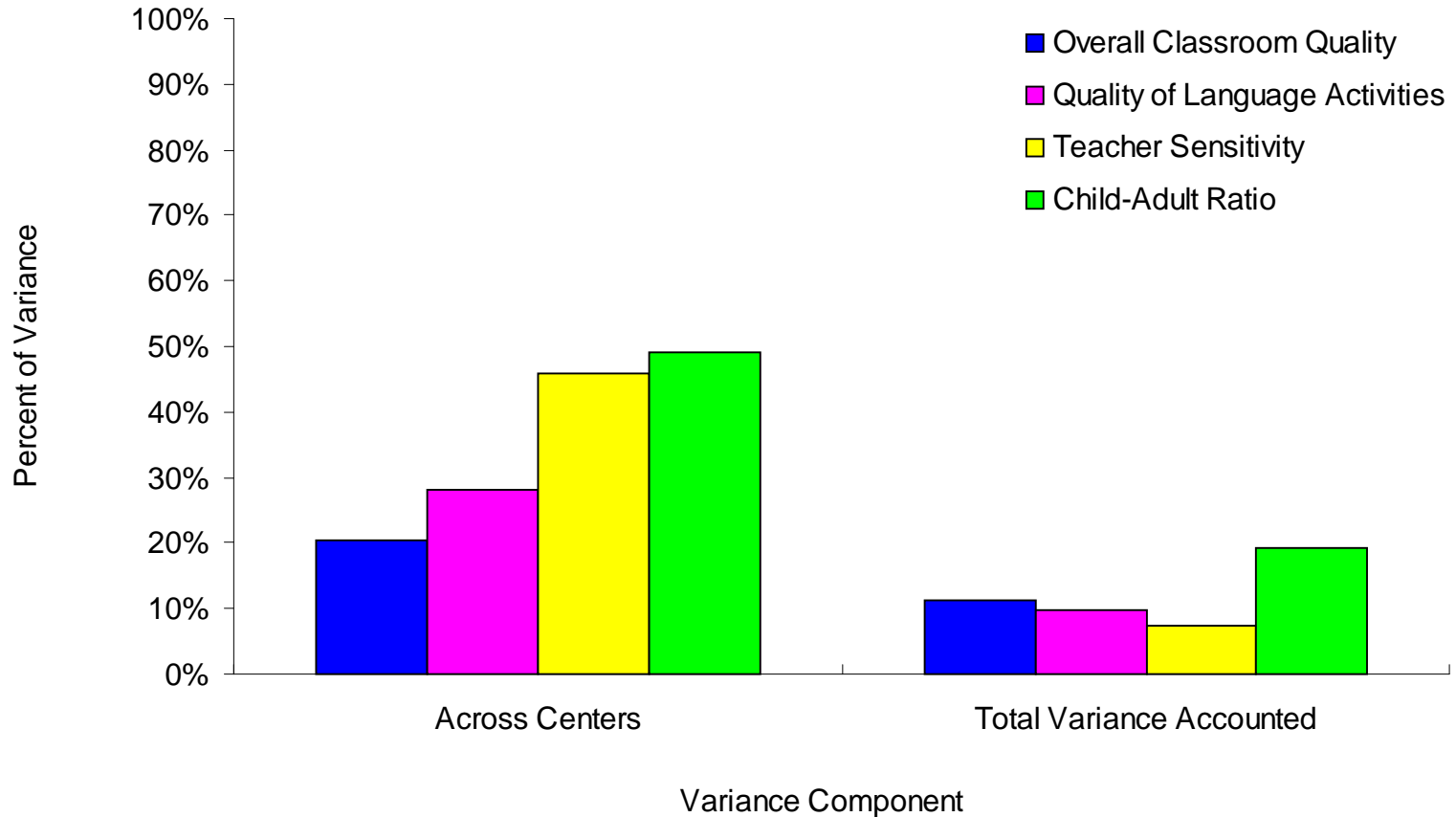
Head Start Family and Child Experiences Survey (FACES), Spring 1998 Data.
Between-Center Variance is not shown because it was neglibile (near 0) for all measures.

Results of Multi-Level Analyses of Classroom Quality

❍ The original relationship between teacher background and experience and classroom quality consistently disappeared when center-level characteristics were entered

❍ Factors at the level of the center including the proportion of minority families, the proportion of families with higher incomes, and the region of the country accounted for a significant amount of the total variation in overall quality (11.2 percent), teacher sensitivity and responsiveness (7.3 percent), the quality of the language instruction (9.6 percent), and child:adult ratios (19.4 percent)

❍ Variations in quality seem to be strongly influenced by center-level factors, more than by the backgrounds or experience of classroom teachers

Conclusions

- The original relationships between teacher background and classroom quality appear to be influenced by factors operating at the level of the Head Start center/program

- Overall, the results suggest that Head Start programs are affected by characteristics of the communities in which they are located, factors which may determine the level of resources available to the programs, in terms of volunteers, financial support, and the pool of qualified individuals available to teach.

- Centers located in communities that are resource-poor may be limited in their ability to find well-trained and experienced teachers and to equip their classrooms with the learning materials and other tools necessary to enhance quality, which will be explored in future analyses.

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